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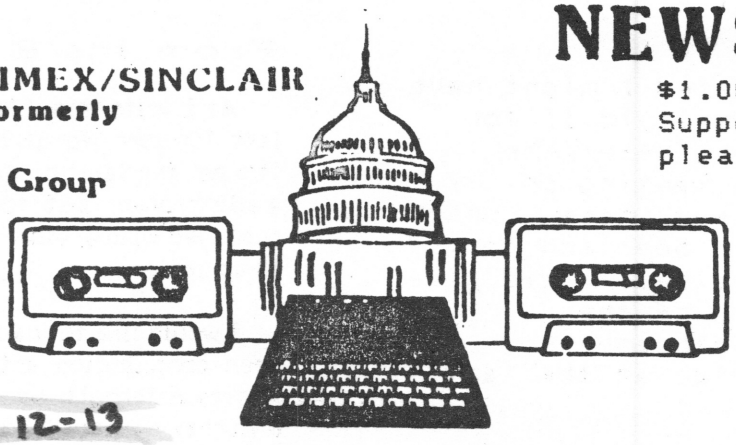

Cass.-Cass Copies 12-13

November 1985
Vol. 3, No. 7

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PRESIDENT'S COLUMN

Short of mailing First Class, there seems to be no way immediately to speed up the Newsletter to you before the monthly meeting date, except occasionally. However, starting January we plan to take out the bulk mailing permit at a local post office rather than go thru the Baltimore office where Jules now has the permit. Also, Bob Minor has agreed to do the leg work required to see if we can't be approved as a non-profit organization by the IRS which would cut our postage cost in half. All in all, we hope to speed thing up substantially by January. However, nothing seems easy.

I am delighted with the Hardware Workshops that Tom Bent is spearheading and with the tremendous response he is receiving from the members. I personally have made the Spectrum emulator board and also have the parts to put the 2068 assembly language, HOT Z, on an Oliger cartridge board. This I will use in the Machine Code Class along with the TS1000 HOT Z.

OMNICALC II

I reported last month that I am excited about the prospect of using the English spreadsheet, Omnicalc II, with my new Spectrum emulator. My first project is to design an accounting system for the Hardware Workshop activity. I am listing the members' names who buy parts across the column headings and then listing the parts available down the left border label column. New names may be added by inserting new columns in alphabetical order. Each month the spreadsheet will include the parts bought and the money paid for each active member, together with totals for each member and a group total. Totals for each set of parts is provided. Those individual and group totals will then be transferred to a second spreadsheet containing running totals for the year. This will make an interesting demonstration of the use of multiple integrated spreadsheets. The totals for each project can also be graphed in bar chart form by the Omnicalc II program. Hard copies can be printed with full sized printers.

continued on p. 2

continued from p. 1

Last month I indicated I might have a full review of Omnicalc II for this issue. However, after the Applications Group meeting on November 2nd at Chevy Chase Library I will be in better position to make a fairer appraisal. I did give a thumb nail sketch of the programm's main enhancements, compared to Memocalc, at the last General Meeting.

MACHING CODE CLASS MEETING DATES: The other change from last month's announcements is regarding the time and place for the Machine Code Class. By popular vote it was agreed that we would meet on Wednesday evenings at 7:30 at my house October 23rd and also two weeks later on November 6th. All the Saturday meetings were really getting to be too much! Mark Fisher is going to help us out from now on as the subject gets more involved with the Sinclair ROM. Those ten purchasers of the David Woods book, which we are using as our text, may want to consider joining the group if you have not done so already. HAPPY COMPUTING. John Conger 654-5751

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N/L DEADLINE.....MEETING DATE

November 9
November 15 December 14
December 20

From the Editor

As I write this, I know that this issue will be late. I'm sorry for it, but it's the best I can do. It's not the fault of the Post Office, or the bulk mailing prep; just too much procrastination, combined with a short lead time. Next month, I hope to do better.

I would like to thank those members that have been contributing articles on a regular basis: Harvey Altergott, Anne Andersen, Ed Arnold, Caroline & Murray Barasch (2), Jim Birney, Tom Bent, Andy Boles, Tony Brooks (5), R. Caufman, John Conger (8), Ken Corwin, Hank Dickson (4), Chuck Fink, Jules Gesang, Jim Henthorn, Brian Little (2), Jim Mackenzie (5), Joe Miller, Mike Morris (2), Alan Pollock, Bill Powers, Roald Schrack (5), Ward Seguin (3), Vernon Smith, Al Strauss, Stew Vance, Bill Ware (2), H.E. Weppler (5), Austin White, George White (3), and Rick White.

ZAPPpp! ....and then....

At the last meeting, I stupidly tried to plug an expansion board on Stan Guttenberg's 2068, while it was on. Even though the expansion board had no active components, it shorted the connectors, and left me with a machine that had a permanent crash. Tom Bent came over, and indicated that the 4416 memory chips sometimes could get zapped in such situations.

The next monday night, we sat down to troubleshoot. On powering up, the display was still the same. One of the 4416 chips was abnormally hot, so I clipped it out and replaced it with a socket and new 4416 chip; no change in the display.

Next, we hauled out Tom's logic probe. We found two lines that had a slow pulse, at the same period as the screen display. The signal was the same on both sides of the buffer chips, so they were good. On looking at the wiring diagram, we deduced that the signal could only have come from the Z80 CPU, or the SCLD chip.

The next day, I clipped the Z80, and replaced it with a socketed one; no change in the display. Therefore, it must be a blown SCLD chip. I phoned the Computer Connection, who couldn't get replacement SCLD chips, but would sell me a new machine for $139.00. I phoned Timex, at 501-372-1111, and learned that they still do repairs, with a maximum charge of $30.00. They claimed that they would repair the machine that was sent, with a two week turnaround time.

As of this writing, the 2068 has been sent. I'll write up the conclusion of this adventure as soon as possible.

Mark Fisher

ATTACHING PRINT DRIVER

The Tasman I/F print driver is easy to incorporate in all your programs that need printer output. It also has a feature that allows you to customize it to send print commands in the print line. Below are steps to "attach" the print driver.

1. Customize print driver according to the software and *Tasman Interface Operating Instructions*. No knowledge of machine code is needed for this. Leave the resulting machine code above RAMTOP.

2. Enter your BASIC program.

3. Add these lines to it. Use line numbers appropriate to your program, but they must be in somewhat these relative positions in the program:

```
4 GO TO 6

5 CLEAR 64715: LOAD "" CODE: RANDOMIZE USR 64719

6 LET SAVE = 5000: LET save = SAVE

5000 SAVE "PGM" LINE 5

5010 BEEP .1,25

5020 SAVE "tasintcode" CODE 64716,652
```

These are all the BASIC lines needed to incorporate the print driver into any basic program you want to run through your printer.

Line 4 skips the LOAD CODE line when a "RUN" command starts the program. Line 5 loads and calls up the machine code print driver. It is the first line of the program the first time it runs after a loading. (If you try to start here without the MC being resident above RAMTOP, you will suffer a crash.)

Line 6 defines two variables: SAVE and save. Use one of these with the GO TO command in the immediate mode. This will take the computer to Line 5000 and instruct it to save the Basic program.

Upon completion of the BASIC program load, the 2068 will procede to Line 5010. This BEEP is to call your attention to the fact that the recorder and/or computer must be restarted to save the machine code routine. When you press any key, the computer passes to Line 5020 and saves the MC.

When saving the complete program, minimum loading time will be assured if you put a "C" battery atop the CAPS SHIFT key, so that the save operation will start the MC save immediately after the BASIC. The "C" cell may be removed any time after the BEEP.

To finish up the operation neatly, type: VERIFY "": VERIFY "" CODE. This will test both parts of the taping.

Austin White
(301) 373-3107

CRYPTOGRAM:

OGLXNE: RIK ANGRY G AISNA YRNGX.

G HNK WNGEY GTI PC ANGRC COGC

WIFE YBIFYN PY OGLXNS GC WIF HIE

GMM RPTOC LIABFCNE YNYYPIRY.

G. White

solution on p. 8

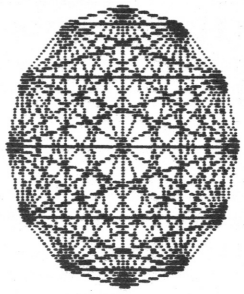
Crypto-pad is available from the club library

NODES

Here is a program that will draw regular polygons with all the diagonals. You choose the number of nodes and the size.

```
  5 DIM x(60)
  6 DIM y(60)
 10 PRINT "give scale ";
 20 INPUT s
 25 PRINT s
 30 PRINT "give number of nodes
";
 40 INPUT in
 45 PRINT in
 50 FOR i=1 TO in
 60 LET z=2*PI*i/in
 70 LET x(i)=4*SIN (z)+15
 80 LET y(i)=4*COS (z)+8
 90 NEXT i
100 LET im=in-1
110 FOR n=1 TO im
120 LET ip=n+1
130 FOR m=ip TO in
140 PLOT s*x(n),s*y(n)
142 LET dx=s*x(m)-s*x(n)
144 LET dy=s*y(m)-s*y(n)
146 DRAW dx,dy
150 NEXT m
160 NEXT n
170 STOP
```

```
give scale 12
give number of nodes 12
```



Roald A. Schrack

Adapting Your Programs For The A&J MicroDrives

by

Kai Cherry

This articale gives Step-by-Step instructions on adapting regular programs to MicroDrive programs using PSION's FLIGHT SIMULATION as an example.

I recently purchased an A&J MicroDrive for my 2068. After reading the Manual a couple of times, I tried it out. In no time, I had mastered using it. I then decided to try and adapt my programs to run from MicroWafers. Here is what I did:

First, select & FORMAT a MicroWafer (SAVE "@1,+").

Next rewind the cassette that you wish to copy to the beginning.

Now, MERGE the first part of the program into memory (MERGE "").

LIST the program if it LOADed into the computer correctly.

```
 10> CLEAR 32627: LOAD ""
SCREEN$ : LOAD ""CODE :
RANDOMIZE USR 51211
```

If the program LOADs other modules, add an AT symbol (@) to the beginning of the filename, and delete extra letters. (Change LOAD ! ""SCREEN$ to LOAD "@screen" SCREEN$ & change LOAD ""CODE to LOAD "@code" CODE for instance.)

After making the nessesary LOAD changes, SAVE the program to MicroWafer as File #1. (SAVE "@1,flight" LINE 10)

VERIFY (VERIFY "@flight) your SAVE.

LOAD the next part of the program from your cassette (LOAD ""SCREEN$)

SAVE this part of the program under the SAME FILENAME THAT WAS IN THE LOADER as File #2 (SAVE "@2,screen"SCREEN$).

VERIFY (VERIFY "@screen" SCREEN$).

LOAD the next section. (LOAD ""CODE)

SAVE under previously assigned filname as File #3. (SAVE "@3,code"CODE 32628,32700).

VERIFY (VERIFY "@code")

Now, the test! Turn off your system AFTER removing your MicroWafer from the drive, and try to LOAD your program from the MicroWafer. (LOAD "@flight" or whatever the first file is.)

To sum all of this up, here's what you do:

(A) FORMAT a MicroWafer.

(B) Rewind tape.

(C) MERGE the first part of the program.

cont'd on p. 5

The VAL$ Function

If you are like me, you have never used the VAL$ function. There is no good explanation in any of the manuals. The "Quick reference guide" states that the function evaluates a numeric expression without its bounding quotes as a string expression. This is only a partial truth. The function can be used on any string expression- numerical or alphabetical. It will remove one level of " " marks from any string expression. As an example let A$="cats" and then let B$="A$". The string "cats" is two levels down so to speak. Equivalently we could have written """cats""". The following exercises demonstrate the application of VAL$.

There must be some tricky applications for VAL$ but I haven't thought of them yet- can you?

Roald A. Schrack

```
 10 LET a$="""""""""1+2"""""""""
 20 PRINT a$
 30 PRINT VAL$ a$
 40 PRINT VAL$ VAL$ a$
 50 LET b$="""1+2"""
 60 PRINT b$
 70 PRINT VAL$ b$
 80 LET c$="b$"
 90 PRINT c$
100 PRINT VAL$ c$
110 PRINT VAL$ VAL$ c$
120 PRINT VAL VAL$ VAL$ c$
```

```
"""1+2"""
"1+2"
1+2
"1+2"
1+2
b$
"1+2"
1+2
3
```

Note the relative number of parentheses in statements 10 and 50.

More examples for the advanced student.

```
 10 LET a$="1+2"
 11 LET g=4
 12 LET h$="g"
 13 LET j$="h$"
 15 LET b$="""1+2"""
 16 LET c$="a$"
 17 LET d$="c$"
 18 LET e$="cats"
 19 LET f$="small,""dogs"" are nice"
 20 PRINT VAL a$
 30 PRINT VAL$ b$
 40 PRINT VAL$ c$
 50 PRINT VAL VAL$ c$
 60 PRINT VAL$ d$
 70 PRINT VAL$ VAL$ d$
 80 PRINT VAL$ "e$"
 90 PRINT e$
100 PRINT f$
110 PRINT f$(7 TO 12)
120 PRINT f$(8 TO 11)
130 PRINT VAL$ f$(7 TO 12)
140 PRINT g
150 PRINT VAL h$
160 PRINT VAL (VAL$ j$)
170 PRINT VAL$ j$+b$
180 PRINT VAL VAL$ j$+VAL VAL$ b$
```

The abowe program generates the following results.

```
3
1+2
1+2
3
a$
1+2
cats
cats
small "dogs" are nice
"dogs"
dogs
dogs
4
4
4
g"1+2"
7
```

---

continued from p. 4

(D) LIST the program.

(E) Change all SAVE & LOAD routines to be compatable with the MicroDrive.

(F) SAVE as File #1, then VERIFY.

(G) LOAD the next portion of the program, & make any changes nessesary.

(H) SAVE as File #2, then VERIFY.

(I) Repeat the LOADing, SAVEing, & VERIFYing process until the entire program is SAVEd to MicroWafer.

(J) Turn off the computer & LOAD the program from the MicroWafer.

That's it! I hope this articale will helpful. If anyone out there knows of, or develops a better method than this one, please let the rest of us in on it.

If you have ANY questions, or your particular program just won't adapt, (sorry, but some just don't!), you can call me at (301)466-4770 after 5:00 PM during the week.

GOOD LUCK!!!

Hi-Res Mandelbrot Plotting

As introduced in last month's n/l, the Mandelbrot set provides an infinite space, filled with unexpected detail and beauty. While anyone can look at the illustrations in Scientific American, this space can only be explored by computer.

The problem is this: while each point is mathematically determined as either a member of the Mandelbrot set or not, it is not possibe to predict ahead of time whether a point on the boundary will belong to the set. This is similar to the situation with the set of prime numbers. It is impossible to come up with a formula that will describe the boundary of either set, as the set is evaluated by a procedure, rather than by a single formula.

Last month, Mr. Schrack introduced the Mandelbrot set with a short program that would plot small sections of the set. The limitations that he imposed were quite deliberate. As each point near the boundary needs 100 iterations, the time to calculate each point can be quite long. Mr. Schrack reduced the runtime to generate a screen by evaluating a limited number of points (704, to be exact), while evaluation of an entire screen in hi-res requires the calculation of 43,769 points.

I wanted to develop a plot that would use the full resolution of the TS2068. Since this would require 62 times as many points to be plotted, I have re-written Schrack's program to obtain the improve the speed in interpereted BASIC.

Speeding Up the Program

The first tool I developed in my attempt is the routine at 3000-3070. This uses the system variable FRAMES as a clock to measure the time taken by a given subroutine. This serves to evaluate the efficiency of the most critical subroutine, now located at 30-80. As variations in the subroutine are developed, they can be tested through 50 iterations, to see if there is any benefit.

The finished program is more complex than the original. This stems from the changes necessary to speed up the program, as well as added functions. Some of the changes, and the relative benefits, are described below.

1) Remove the SQR function: I found that I could double the speed of the routine by removing the SQR from the original listing. All trig and exponential functions involve an immense amount of calculation, and sometimes it is possible to avoid their use. In fact, -2^2 will bomb, whereas -2*-2 will work fine.
2) Initialize the critical variables first, upon RUN: this reduced the time lost searching for each variable.
3) Move critical subroutines to the beginning of program: BASIC searches for a subroutine from line 0 each time it is called. Moving it to the beginning speeds up that search. The REM statements at the first do not signifigantly slow it down.

3a) Conversly, move non-critical routines to the back: As you read the listing, you will notice that the main entry routine is at 8000. As the program progresses, the area of the program in use gradually moves foreward. This makes the flow of a program less intuitively obvious, but I hope that my REMs help to clarify the flow.

4) Squeeze the critical subroutine into a single line: this yeilds a small speed increase.
5) Use single letter variable names: the operating system takes more time to verify a multi-letter variable.
6) Reduce the number of iterations: The original mainframe program used 1000 iterations. A.K. Dewdney, in the August Scientific American, recommended 100 for a home computer. For the images shown here, I have used 50. In doing so, I lose definition at the boundary, at high magnifications. You may need to use 100 or more iterations to continue to resolve fine detail at higher magnifications.

But even so, 43,000 points take a long time...

Yes, but there are some things you can do. I have added a function that lets you see an overview of the selected area, before buckling down to plot every single point. This was difficult for me to work out; see the BASIC puzzle in this issue.

The screen is calculated in a number of passes; at each pass, four times the number of points are calculated. Line 140 checks to avoid calculating a point twice.

And the 2068 can't assign colors to individual pixels...

Yes, but it is possible to take the same information that was used in the original to determine color (the variable c) and use it to determine shading (line 520). If you prefer a more definite edge, all points outside the set can be PLOTted (line 530). Use a REM at the beginning of the line you wish to exclude to select the option you want.

Typing in the program

The listing as included is fairly long. There

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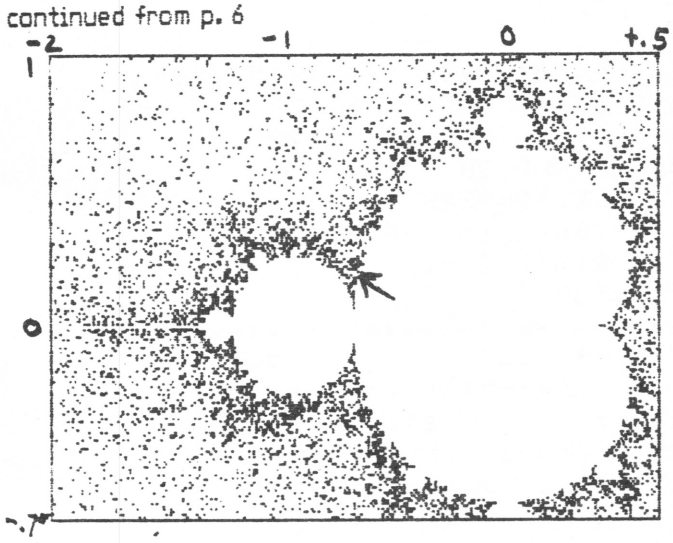
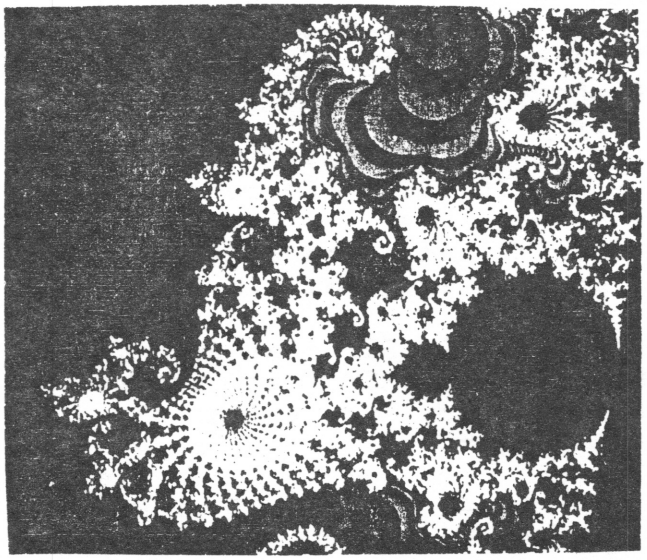
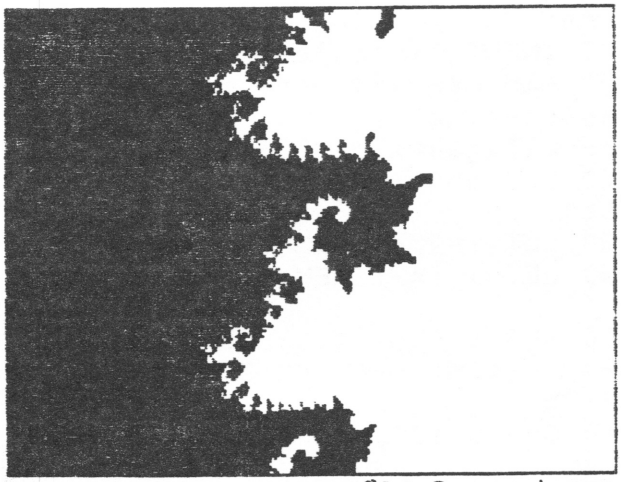
continued from p. 6



The complete Mandelbrot set. The arrow points to the area enlarged in the following two illustrations.





Real -.76482213 imag .18972332 side .04940711

The upper illustration is from The Scientific American. The lower illustration was generated by this program. Notice how stopping at 50 iterations ignores the detail at the boundary of the set.

are two options included in the listing that can be left out. Lines 1000-3070 cover cursor movement and the timer utility. The cursor is useful in deciding what subsection to investigate next, but not necessary.

Lines 9000-9080 are a renumber routine (that's why the rest of the program is so neat) that will renumber blocks of program lines. If you don't intend to fiddle with the code, you could easily leave it out.

Using the program

Type'er in and RUN! For the plot of the entire Mandelbrot set, use Real coordinate -2, Imaginary coordinate 1, and side length 2.5. The coordinates of the cursor are calculated using the variables ACORNER, BCORNER and SIDE. If you have loaded a new SCREEN$, these varibles may not apply. I'm working on a way to encode those values in the border of the screen, so that they'll automatically be correct - but that's in the future.

The complete program, together with the plot of the full Mandelbrot set, is available in the club library. Next month (??) I'll show how to print hi-res plots of the Mandelbrot set on your 1000 and 2040 printer.

```
  1 REM      Mandelplot
Idea from A.K.Dewdney, Formulas
 from R.A.Schrack, by Mark Fish
er1985
  10 DEF FN m(a,b,c)=a/b-INT (a/
b)=(a/c-INT (a/c))
  20 GO TO 8050
  30 FOR c=1 TO 50
  40 IF INKEY$="o" THEN  RETURN

  50 IF INKEY$="p" THEN  GO TO 5
00
  60 LET t=e: LET e=2*d*e+b: LET
 d=d*d-t*t+a: IF d*d+e*e>4 THEN
  GO TO 500
  70 NEXT c
  80 RETURN
 100 REM **********************
        * main scan routine *
         **********************
 110 FOR y=i*INT (174/i) TO 1 ST
EP -i
 120 PRINT #1;AT 0,0;"""p""= PLO
T ","""o""= skip","""v"" for va
rs.","""s""= SAVE"
 130 FOR x=1 TO 254 STEP i
 140 IF FN m(x-1,i,j) AND FN m(y
,i,j) THEN  GO TO 220
 150 LET a=x*gap+acorner
 160 LET b=bcorner-(175-y)*gap
 170 LET d=0
 180 LET e=0
 190 PLOT x,y: REM shows point b
eing considered
 200 GO SUB 30
 210 PLOT x,y: REM erases marker
```

continued on p. 8

continued from p. 7

```
 220 IF INKEY$="v" THEN  PRINT #
1;AT 0,0;"c=";c,"i=";i,"x=";x,"
y=";y;"      "
 230 IF INKEY$="s" THEN  GO SUB
9900
 240 NEXT x
 250 NEXT y
 260 LET j=i: LET i=i/2: IF i>=1
 THEN  GO TO 100
 270 STOP
 500 REM ****************
         * plot routine *
          ****************
 510 IF s>c THEN  LET s=c
 520 REM  IF RND*(50-s)+s-10<c T
HEN  PLOT x,y
 530 PLOT x,y
 540 RETURN

 1000>REM ***********************
 *     * cursor movement section
  *     ************************
 ***
 1010 PRINT #1;AT 0,0;"Stick = mo
 ve cursor; FIRE = get coord.;""
 q"" = start calc at coord"
 1020 LET x=204: LET y=72
 1030 DIM z$(4)
 1040 PLOT x,y: PLOT x-1,y: PLOT
 x+1,y: PLOT x,y+1: PLOT x,y-1
 1050 LET z= STICK (1,1)
 1060 LET z$(1)=STR$ (2*(z/2-INT
 (z/2))): LET z=z-VAL z$(1)
 1070 LET z$(2)=STR$ (2*(z/4-INT
 (z/4))): LET z=z-VAL z$(2)
 1080 LET z$(3)=STR$ (2*(z/8-INT
 (z/8))): LET z=z-VAL z$(3)
 1090 LET z$(4)=STR$ (2*(z/16-INT
  (z/16)))
 1100 PLOT x,y: PLOT x-1,y: PLOT
 x+1,y: PLOT x,y+1: PLOT x,y-1
 1110 LET x=x+((x<253) AND (z$(4)
 ="1"))-((x>1) AND (z$(3)="1"))
 1120 LET y=y+((y<173) AND (z$(1)
 ="1"))-((y>1) AND (z$(2)="1"))
 1130 PLOT x,y: PLOT x-1,y: PLOT
 x+1,y: PLOT x,y+1: PLOT x,y-1
 1140 IF  STICK (2,1)=1 THEN  PRI
 NT #1;AT 0,0;,,,,,;AT 0,0;"acorn
 er = ";x*gap+acorner'"bcorner =
  ";bcorner-(174-y)*gap: LET os=
 x*gap+acorner
 1150 IF INKEY$="q" THEN  LET aco
 rner=x*gap+acorner: LET bcorner
 =bcorner-(174-y)*gap: LET side
 =os-acorner: GO TO 8150
 1160 GO TO 1050
 3000 REM *** To optimize code, u
 se #3020 before & after as time
 r
 3010 REM (remember to change e t
 o t)
 3020 LET t1=PEEK 23672+256*PEEK
 23673+256*256*PEEK 23674
 3030 LET x=204: LET y=72
 3040 GO SUB 30
 3050 LET t2=PEEK 23672+256*PEEK
 23673+256*256*PEEK 23674
 3060 PRINT t2-t1
 3070 STOP
 8000>REM ************************
        *input & setup routines
 *       ************************
 **RUN for cold start
   GO TO 8000 for warm start
    GO TO 8150 to recalculate us
 ing same coords.

 8010 BORDER 0: PAPER 0: INK 7: C
 LS : OVER 1
 8020 PRINT '''''''''"Mandelplot"'
 '"Idea from A.K.Dewdney"'"Formu
 las from R.A.Schrack"''"by Mark
  Fisher"''"1985"''"Now Loading
 Screen"
 8030 LOAD ""SCREEN$
 8040 GO TO 1000: REM cursor move
 ment
 8050 REM initialize critical var
 s. on cold start as first vars.

 8060 LET d=0: REM real accum.
 8070 LET e=d: REM imag. accum.
 8080 LET a=d: REM real point
 8090 LET b=d: REM imag. point
 8100 LET t=d: REM temporary "e"
 8110 FOR c=0 TO 0: NEXT c: REM i
 nitialize count
 8120 INPUT "real coord. =";acorn
 er
 8130 INPUT "imaginary coord =";b
 corner
 8140 INPUT "side length?";side
 8150 REM restart here to preserv
 e acorner, etc.
 8160 LET gap=side/253
 8170 LET s=50: REM keeps smalles
 t "c"
 8180 LET i=256: REM step size
 8190 LET j=i*2: REM old step siz
 e
 8200 CLS : PLOT 0,0: DRAW 255,0:
  DRAW 0,175: DRAW -255,0: DRAW
 0,-175
 8210 GO TO 100
```

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CRYPTOGRAM Solution:

HACKER: NOW MEANS A MODEM SNEAK. A FEW YEARS AGO IT MEANT THAT YOUR SPOUSE IS HACKED AT YOU FOR ALL NIGHT COMPUTER SESSIONS.

continued from p. 8

```
9000)REM ************************
    * renumber and SAVE utils.
*    ************************
**
9005 INPUT "start ?";start
9006 INPUT "end ?";end
9007 IF end)9000 THEN  LET end=9
000
9008 INPUT "start new #@ ?";st
9010 LET x=PEEK 23635+256*PEEK 2
3636
9020 LET n=st
9025 IF PEEK x*256+PEEK (x+1)<st
art THEN  GO TO 9070
9030 IF PEEK x*256+PEEK (x+1)>=e
nd THEN  STOP
9040 POKE x,INT (n/256)
9050 POKE x+1,n-(PEEK x*256)
9060 LET n=n+10
9070 LET x=x+PEEK (x+2)+PEEK (x+
3)+4
9080 GO TO 9025
9900 REM *** save screen in prog
ress ***
9910 SAVE "mand" LINE 220: SAVE
"mand"SCREEN$
9920 RETURN
9990 REM *** SAVE full pgm ***
9991 SAVE "mand" LINE 8000: SAVE
 "mandelbrot"SCREEN$
```

MF

Hacking Tips - For Gamesters

Spectrum Edition
by Paul Millan

From The National Software Library,
and LIST

Since a lot of membersare now able to run Spectrum programs, I thought the following POKEes might be of interest. A "*" following the entry means that the game is included on the SOFT-AID compiliation tape.

Jet Set Willy
POKE 50552,170: POKE 50553,170 Blocks Hades
POKE 37982, POKE 37994,0: Walk thro' Monsters
POKE 60231,0 Improve conservatory
POKE 36545,0: POKE 56878,4 Banyan Tree easier
POKE 57411,160: POKE 57362,26: POKE 57464,170 Safer in Priest's Hole
POKE 50512,168: POKE 50520,168, POKE 50528,170 Ledge in Security Guard
POKE 54814,0 Removes star from Stairway
POKE 37925,0 Go straight to bed
POKE 64610,21: POKE 64632,85: POKE 64633,85: POKE 64634,(lost): POKE 64635,4: POKE 49386,60: POKE 49263,0: POKE 49271,0 Travel between The Bow and Off Licence
POKE 56350,0: POKE 56358,0 Adds platform to First Landing
POKE 41983,255 When you collect the tap, you can see the final effect
POKE 36835,239 You can use Interface 2
POKE 38240,0 Obliterates Martha
POKE 59900,0 Disables the Attic bug

Cookie
POKE 26197,0 Stops Bin monster

Freeze Bees
POKE 34610,0 Infinite lives

Pi-Balled
POKE 44416,x x=number of lives

Pyramid
POKE 44685,0 Limitless energy

Arcadia
POKE 25776,0 Infinite lives

Wild West Hero
POKE 23821,x x=number of lives

Kokotoni Wilf *
POKE 43742,0 Infinite lives
POKE 42214,x x=number of lives
POKE 42177,2 This changes the color of most of the sprites to red, so you don't die if you touch them.

Horace Goes Skiing *
POKE 29270,0 Removes all traffic
POKE 30762,0 Removes ski slope

Sabre Wulf
POKE 44786,0 Indestructable Sabreman
POKE 39702,30 Kills materializing monsters
POKE 44685,186: POKE 44575,255: POKE 44677,80 Stay permantely Cyan

Atic Atac
POKE 36519,x x=number of lives
POKE 37229,179: POKE 37280,175 Makes doors open more frequently

Others are shown in the LIST newsletter. They cover Frank n Stein, Psytron, Pssst, Jetpac, Project Future, Zip-Zap, TutanKhamen, Defenda, Mr. Wimpy, Monty Mole, Eskimo Eddie, Luna Jet Man, Moon Alert, and Horace & the Spiders. If you're interested, come to a diehard's meeting to check up on what's there.

signetics FULLY ENCODED, 9046 x N, RANDOM ACCESS WRITE-ONLY-MEMORY 25120

FINAL SPECIFICATION(10)

DESCRIPTION

The Signetics 25000 Series 9046XN Random Access Write-Only-Memory employs both enhancement and depletion mode P-Channel, N-Channel, and neu(1) channel MOS devices. Although a static device, a single TTL level clock phase is required to drive the on-board multi-port clock generator. Data refresh is accomplished during CB and LH periods(11). Quadri-state outputs (when applicable) allow expansion in many directions, depending on organization.

The static memory cells are operated dynamically to yield extremely low power dissipation. All inputs and outputs are directly TTL compatible when proper interfacing circuitry is employed.

Device construction is more or less S.O.S.(2).

FEATURES

- **FULLY ENCODED MULTI-PORT ADDRESSING**
- **WRITE CYCLE TIME 80nS (MAX. TYPICAL)**
- **WRITE ACCESS TIME (3)**
- **POWER DISSIPATION 10uW/BIT TYPICAL**
- **CELL REFRESH TIME 2mS (MIN. TYPICAL)**
- **TTL/DTL COMPATIBLE INPUTS(4)**
- **AVAILABLE OUTPUTS "n"**
- **CLOCK LINE CAPACITANCE 2pF MAX.(5)**
- **$V^{CC} = +10V$**
- **$V^{DD} = OV \pm 2\%$**
- **$V^{FF} = 6.3V^{ac}$ (6)**

APPLICATIONS

DON'T CARE BUFFER STORES
LEAST SIGNIFICANT CONTROL MEMORIES
POST MORTEM MEMORIES (WEAPON SYSTEMS)
ARTIFICIAL MEMORY SYSTEMS
NON-INTELLIGENT MICRO CONTROLLERS
FIRST-IN NEVER-OUT (FINO) ASYNCHRONOUS BUFFERS
OVERFLOW REGISTER (BIT BUCKET)

PROCESS TECHNOLOGY

The use of Signetics unique SEX(7) process yields Vth (var.) and allows the design(8) and production(9) of higher performance MOS circuits than can be obtained by competitor's techniques.

BIPOLAR COMPATIBILITY

All data and clock inputs plus applicable outputs will interface directly or nearly directly with bipolar circuits of suitable characteristics. In any event use 1 amp fuses in all power supply and data lines.

INPUT PROTECTION

All terminals are provided with slip-on latex protectors for the prevention of Voltage Destruction. (PILL packaged devices do not require protection.)

SILICON PACKAGING

Low cost silicon DIP packaging is implemented and reliability is assured by the use of a non-hermetic sealing technique which prevents the entrapment of harmful ions, but which allows the free exchange of friendly ions.

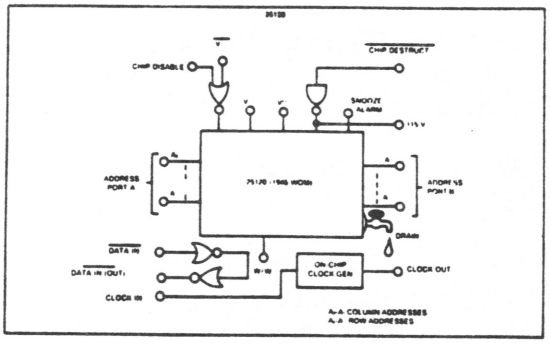
SPECIAL FEATURES

Because of the employment of the Signetics' proprietary Sanderson-Rabbet Channel the 25120 will provide 50% higher speed than you will obtain.

COOLING

The 25120 is easily cooled by employment of a six-foot fan, ½" from the package. If the device fails, you have exceeded the ratings. In such cases, more air is recommended.

BLOCK DIAGRAM

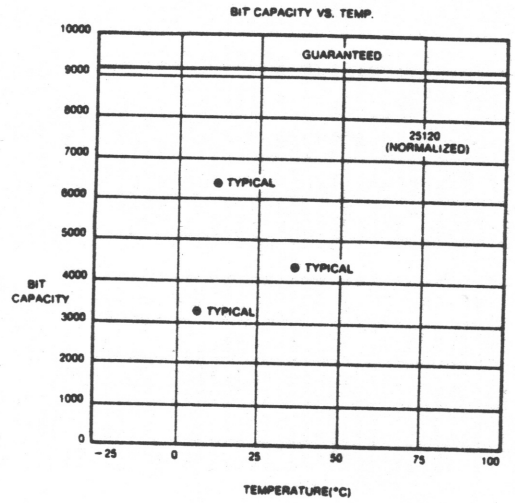


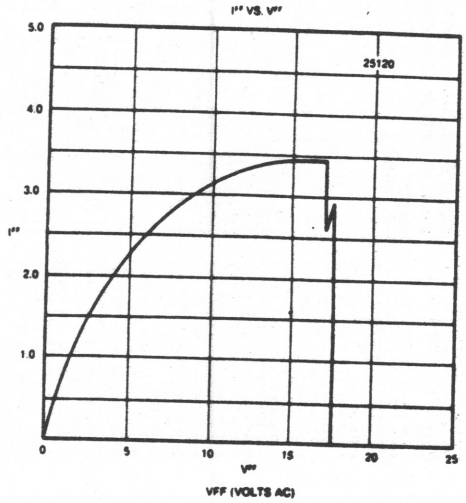
1. "Neu" channel devices enhance or deplete regardless of gate polarity, either simultaneously or randomly. Sometimes not at all.
2. "S.O.S." copyrighted U.S. Army Commissary, 1940.
3. Not applicable.
4. You can somehow drive these inputs from TTL, the method is obvious.
5. Measure at 1MHz. 25mVac. 1.9pF in series.
6. For the filaments, what else!
7. You have a dirty mind. S.E.X. is Signetics EXtra Secret process. "One Shovel Full to One Shovel Full", patented by Yagura, Kashkooli, Converse and Al. Circa 1921.
8. J. Kane calls it design (we humor him).
9. See "Modern Production Techniques" by T. Arrieta (not yet written).
10. Final until we got a look at some actual parts.
11. Coffee breaks and lunch hours.
12. Due credit to EIMAC for inspiration.

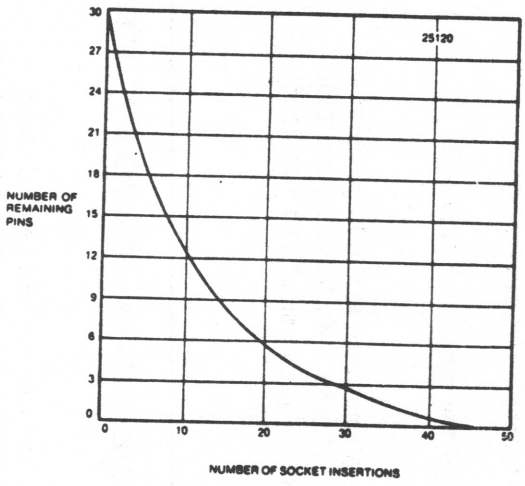
Figure 12-11. Write only memory.

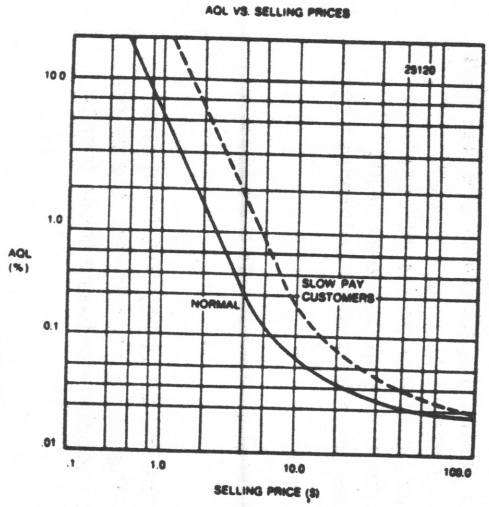
SIGNETICS ■ 25120 FULLY ENCODED, 9046XN, RANDOM ACCESS

TYPICAL CHARACTERISTIC CURVES









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811 EAST ARQUES AVENUE ■ SUNNYVALE, CALIFORNIA ■ 94086
TEL: (408) 739-7700 ■ TWX: (910) 339-9283 ■ A Subsidiary of CORNING GLASS WORKS
D304 MOS-005-39

A BASIC Puzzle

In this issue's article on Hi-res plotting of the Mandelbrot set, I came up with an intreguing challenge. Plotting every point on the screen is a tedious procedure. By the time a signifigant part of the image has been generated, several hours may have gone by. If there was some way to get a quick overview of what would appear on the screen, the operator could decide to change the area being examined before wasting hours on an uninteresting area.

The puzzle is in several parts, each of increasing difficulty.

1) PLOT a line across the screen by PLOTting first the midpoint, then the midpoints between the points PLOTted, then the midpoints between those points, etc.

2) Ensure that no point is PLOTted twice.

3) PLOT the entire screen - two dimensions.

4) Start at the top of the screen - Y axis will decrement.

A sample solution is embedded in the Mandelbrot program, lines 10, 110, 130, 140, 240, 250, and 260. I'm sure that there are better solutions - go to it!

MF

CASSETTE TO CASETTE COPIES

Last month's issue on page 12 had a brief article on copying programs from cassette to cassette, using a machine code program and a direct connection from one recorder to another. Mark Fisher appended a note saying he couldn't get it to work. I believe the reason was that

continued on p. 13

Manchester Guardian

The day the Paris switching system went to press and copped a packet

David Bodanis reports from France on a case of information overload

ON JUNE 18 this year, something terrible happened in Paris. The computer network that handles information transfer between banks, businesses, and other data sources; a network which is four times larger than its' largest American competitor, that was used to set the international specifications for such systems, and has been sold in huge, and lucrative, export orders: that computer network began to fall apart.

First one centre in Paris started doing strange things, then the other two in that city started to go, then the faults surfaced at Lille, over 200 kilometres away, and by that time there was no stopping it: the whole system was fading away. Officials of the DGT (Direction Generale des Telecommunications) said there was nothing to worry about, formed a "cellule de crise" where they could go quietly frantic about the problem, and then announced that they should have most of the system running again within a few months, and the rest by early 1986.

Since the system — called Transpac — is similar to ones we're likely to be seeing more of in the next few years, a look at what produced the June 18 disaster might be in order.

Transpac began as a way of solving the problem of wasted time. In an ordinary phone conversation you talk, and I talk, then you talk again, but most of the time, in the pauses for thought, and above all in the thousands of very brief pauses between individual sounds, there is nothing at all going down the phone lines.

That means that the pathway of insulated copper wires that has been expressly set up for the conversation between my phone and yours (for by dialling each other we've commandeered it) is spending most of its time sitting out of service and disused. That's a waste of copper, connections and money, and if a way could be found to overcome that waste, someone would get very rich.

By the mid 1970s there were many solutions on offer. The answer Transpac uses was to forget about the phone conversation as a link between my phone and yours, but rather to think of it as a way of our mutually sending our precious phonemes into the national phone grid and trusting that somehow they will come out right on the other side.

What Transpac does is to snip off the first 128 bits of the first sentence you say, wrap that up as a single package of information, put my phone address on that package as a little label, and then plop the addressed package into a computer that's connected to every bit of copper-centered phone line in France. Those phone lines are conveyor belts crammed with other neatly wrapped packages being shunted around, and when a gap looks like opening up in the direction the tag on your special packages says it should go, the computer replops the package back out, on to a conveyor belt of a line going in the direction of my phone. When it reaches my phone the address tag is lopped off, and only your 128 bits of sound come out.

If there are ten packages in your first full sentence, they might well arrive at my phone over ten different conveyor belt lines, squeezed in amongst other packages wherever there's a free spot. But since humans speak at most at 200 words per minute, and Transpac computers can pull information items on and off their chosen conveyor belt at several million times per second, there is no problem with your ten packages coming to me in the right order, and with no more stammering or strange silences between them than you chose to put in.

At the start this was okay. Transpac began working in 1979, and the companies that needed it for transferring computer files between their offices started signing on, leaving their old phone contracts behind. The software was good enough to see that all the scurrying addressed packages were sent to the right place without problem (the transmission error rate was one fault in ten billion characters sent). The traffic built up to 400 billion characters a month, apparently four times that of the largest comparable American system. And with these successes, export orders came in: from Australia, the People's Republic of China, Brazil, Taiwan, the US, and elsewhere.

It's when other computers than the business ones in France starting using Transpac that the problems set in.

The French Government supplies, for free, small personal computers, with a full keyboard, to any telephone subscriber who asks. It had been growing fairly well — there were 300,000 of them in mid 1984 — but as in Britain there was the problem of what exactly to do with them all. The offerings that government departments could think up were, well, the sort of offerings that government departments could think up.

Why not, some genius at the DGT suggested, bring in this wonderful new Transpac system? He knew not what he wrought.

Since Transpac was so cheap (working on the equivalent of local calls), it was possible for the Government to offer big kickbacks to any publication that put itself on the home-computer system. Home users would be charged 60 francs an hour to call up newspapers on their screen, and of that charge 37.5 francs would be refunded to the particular paper that was called.

This was the incentive that worked. Numerous French newspapers and magazines started putting themselves on offer to all those home computer users. It is very convenient to call them up, and very tempting too. Over 500,000 more of the free home computer terminals were installed in the year since then, and by June about 12 million calls a month were being made, up 350 per cent from 1948.

This is what swamped Transpac. On June 18 one call too many was made in the Paris region. That put the Transpac sorting software there into a usage range it had never been planned for, and it started to break down. Now breakdowns in software are something all good programmers know to take care of in advance. Transpac, neatly enough, was designed to switch calls into an adjacent switching centre if something wasn't working in the one the call had initially entered.

This was the worst possible thing to do. The first Transpac centre in Paris (there are three in Paris, and 28 in all the country), being swamped, sent the calls on to the second Transpac centre there, just enough to swamp it in turn, and so on down the line, whence the collapse in distant Lille mentioned earlier, and

Everything went. Interbank information transfers, airline reservations, communication between different offices of large industrial groups: all the 25,000 business subscribers in France who had been forward looking enough to link their computers up via Transpac were now stuck.

The first thing Transpac programmers tried, in the week after the catastrophe, was to stop overloaded switching centres from automatically passing on their overloading to neighbouring centres. It was a neat idea, but it didn't work. Software in a system as sophisticated as Transpac is far too complex to change like that. There are hundreds of thousands of lines of programming, which clever specialists have carefully interwoven over years to make a unified system. Reweaving, on any level more sophisticated than grabbing one loose thread and tugging, is not easy.

The DGT had to announce that users of the home computers would not be able to call up the newspapers and other services they wanted during busy hours. This infuriated the Government, which realised it would put off users of the home computers it was trying to push; it also upset the newspapers and magazines that had finally spent all the effort to get in on the network. They threatened to sue.

There were interesting jurisprudential aspects to the case. In times of emergency a utility can ration its customers. But because of a programming fault can it abrogate service to some clients, while continuing as normal with others?

The DGT, worried that a legal precedent might go against them, volunteered to pay the newspapers and magazines for what they were missing. They also, to keep the ordinary users happy, announced that from now on home computer users calling up their services would be billed only from the time they made contact with the section they wanted, and not from the time they started dialling.

Since Transpac and its DGT superiors were in a paying mood, other organisations in France took the opportunity for some gentle extortion. The French phone board, so haughtily left behind by the Transpac salesmen before, now offered 5,000 of their lines for business information transfers that had until the crash been packaged and switched around by Transpac, but which might now interfere with the programming changes if they were allowed into the system. Of course the DGT would have to pay to subsidise them, all 5,000 long distance lines, so the business users would still feel they were only making local calls.

Also the French satellite operating offices, whose Telecome 1A and 1B satellites were not getting sufficient use, made a deal wherein they would offer to help Transpac, too, for a price, over this difficult interval. Let programmers of British systems beware.

Special Printer Commands From M-SCRIPT

M-SCRIPT has the ability to do a number of print modifications as part of its own program. Headers, indents, double spacing, and dozens of other functions are possible with the appropriate commands. There are times, however, when you may want to use your printer's special abilities. M-SCRIPT provides a method to allow you to send your printer its own special codes.

The Printer

The bottom line is that you want to tell your printer to perform one of its special functions. The first place to start is your Printer's manual. It will have descriptions of each of its features, and, at the back, a summary of its commands. An example of some commands, as listed in the summary, would be:

Star-Gemini 10X

Control Code	Decimal	Hexi-decimal	Function
ESC-1	45 1	2D 01	Underline
ESC-0	45 0	2D 00	Cancels underline
ESC 4	52	34	Selects Italics
ESC 5	53	35	Cancels Italics

What signal needs to be sent to engage each of these functions is not immediately obvious. With some deduction, however, we can untangle the summary.

Decimal	Hexi-decimal	LPRINT	Function
27 45 1	1B 2D 01	CHR$ 27+"-"+CHR$ 1	underline
27 45 0	1B 2D 00	CHR$ 27+"-"+CHR$ 0	Cancels underline
27 52	1B 34	CHR$ 27+"4"	Selects Italics
27 53	1B 35	CHR$ 27+"5"	Cancels Italics

After you understand what the printer expects with each command (the syntax), you are ready for the next step.

On to M-SCRIPT

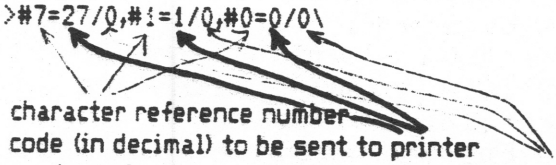
Look at the last table, in the LPRINT column. Characters that appear within quotes in this column can be sent directly to the printer by M-SCRIPT. Characters described by CHR$?? are called unprintable characters, or control codes. They can also be sent, but they must be handled differently.

There are three steps to sending unprintable characters.

Step one: establish what unprintable characters you will need. In this case, we need CHR$27, CHR$ 1, and CHR$ 0. M-SCRIPT can hold ten different unprintable characters. In the text, they are called forth by Function-G (©), followed by a number from 0 to 9. Each ©-number combination will generate a unique unprintable character, as defined by you in.....

Step two: insert a control line in your text file as the first line. This line will hold the values of the unprintable characters you are using. An example, using the three values above, would be:

>#7=27/0,#1=1/0,#0=0/0\



character reference number
code (in decimal) to be sent to printer
number of spaces on the printed line the code will occupy

Step three: invoke the control codes as you need them. To underline what comes next, press Function-G, then the needed number. Since underline needs CHR$ 27, a hyphen, and CHR$ 1, we would use ©7-©1this will be underlined ©7-©1. Note that there are no spaces between the characters.

What if I need more than 10 different codes?

No problem--just insert a second definition line as needed.

---

the signal strength (not the voltage) must be reduced to make good, loadable copy.

Radio Shack sells a neat little item called an "Attenuating Patch Cord" for $2.99. This takes the EAR signal from the source recorder and inputs the MIC socket of the second recorder with the proper signal strength. It works like a charm, needs no mc program or black box and puts you in the position of being able to copy any program on cassettes. I would hate to tell youall about this if I weren't absolutely sure our members were all absolutely honest. (That last "were" is the subjunctive mood!)

JC

Timex of Portugal

Timex or not ?

I recently noticed that the English Micro Connection of Rhode Island are selling something called 'The EMC Portuguese disc drive'. It turns out that Timex Portugal don't want the Timex name mentioned because of problems with Timex U.S.A. Therefore the Timex name has been removed from the equipment and EMC is selling the disc drive with a manual they have prepared with all references to Timex removed.

The reports I've read on the Timex disc drive are for the most part favourable but there are problems in finding supplies of 3 inch discs. I've only seen one advertisement for them by Sum-Ware at $4.75 each. That makes them expensive compared with 5.25 inch discs which are easy to obtain.

The English magazine Your Spectrum claims that a new 128K Spectrum will be launched in Continental Europe before Christmas. U.K. launch will be delayed until after Christmas so that Dixons can dispose of unsold stocks of 48K Spectrums and Q.L.'s at discount prices. The new 128K Spectrum will be compatable with 48K Spectrum software (a real novelty for Sinclair).

Hardware devices for making backup copies of Spectrum tape software onto tape/microdrive/disc are on the increase. Two more such devices appeared in September. One of them called 'Interface 007' is capable of making backup tape copies that can run at 1,2,3,4,or 5 times normal tape speed. In addition programs may be saved to microdrive or disc. The cost is less than 30 pounds (plus 4 pounds postage to the U.S.A.) which makes it 10 pounds cheaper than competitors devices.

Regards

TONY BROOKS

PEEKING EXROM

The 2068 PEEK function gives access to the Home ROM and the RAM (0 to 65535), but not to the 8K Extension ROM.

The program PEEK EXROM permits examination of the Extension ROM by copying it into the RAM at locations 50000 to 58191. There it may be peeked normally.

The machine code in lines 80 and 100 provides entrance to and exit from Exrom per Fig. 3.2.2-2 of the 2068 Technical Manual. Line 90 holds the actual transfer of data, using:

```
LD HL, 0d
LD DE, 50000d
LD BC, 8192d
LDIR
```

After running the program, peek Exrom (0 to 8291) by using the desired Exrom number plus 50000. For example, to examine Exrom 1234 enter PRINT PEEK 51234;the response should be 17.

To see how quickly LDIR moves the 8192 bytes type RANDOMIZE USR 65000 again and ENTER. OK should appear in about 1/15 sec.

```
  10 REM ############ PEEK EXROM
  20 CLEAR 64999
  30 LET N=65000
  40 READ MC: IF MC=999 THEN GO
TO 110
  50 POKE N,MC
  60 LET N=N+1
  70 GO TO 40
  80 DATA 219,255,203,255,211,25
5,219,244,50,195,92,62,1,211,244
  90 DATA 33,0,0,17,80,195,1,0,3
2,237,176
 100 DATA 58,195,92,211,244,219,
255,203,191,211,255,201,999
 110 RANDOMIZE USR 65000:LIST 120
 120 REM ######### PEEK EXROM AT
     EXROM # (0 TO 8191) + 50000
```

H.E.Wepplers

Capitol Area Timex/Sinclair Users' Group
P.O.Box 725
Bladensburg, MD 20710

Name _____

Address _____

_____ ZIP _____

Phone Home _____ Office _____

Memberships - $15.00 (family/individual);make checks payable to C.A.T.S.

If family membership, please list family members participating:

_____

Occupation _____

Ham Radio call sign _____

Equipment

ZX 80 _____ RAM size _____

MA 80 _____ full keyboard _____

ZX 81 _____ Printer _____

TS 1000 _____ type _____

TS 2000 _____ other interface _____

Special interest use for computer: ie, games, ham radio interface, business, other, etc. _____

_____

Languages: Basic _____ Other _____

Machine _____ _____

No. of years computer experience _____

What committees would you like to serve on? _____

_____

Comments: Where did you hear of C.A.T.S.?

_____

- -

Do not write below:

Dt. Pd. _____ Amt. _____ Membership No. _____

Ca. _____ Ck. _____

The mailing address of the Capitol Area Timex/Sinclair User's Group is:

Capitol Area Timex/Sinclair User's group
P.O. Box 725
Bladensburg, MD 20710

CATS is a non-profit special interest organization dedicated to serving the interests of those who own, use, or are interested in learning more about the Timex/Sinclair family of personal computers.

The official contact person for CATS is JULES GESANG:

301#922-0767

Meetings are held on the second Saturday of each month at 2 P.M. in the large meeting room of the New Carrollton Branch Public Library.

Ham Radio Network Information

QZX Net...Wednesdays, 9p.m. local time; 14.345 MHz NU4F NCS
Eastern Regional Sinclair Net...Sundays, 1600 Z; 7.245 MHz
KQ2F NCS

CATS Newsletter
P.O. Box 725
Bladensburg MD 20710

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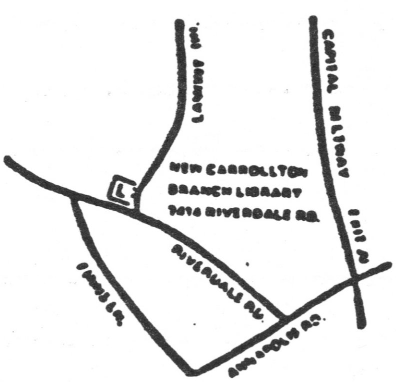

The next meeting of C.A.T.S. will be on:
Saturday, November 9.
11:00 AM Hardware workshop,
2:00 PM General meeting.

New Carrolton Public Library
7414 Riverdale Road, New Carrolton, MD

IF YOU ARE NOT A MEMBER OF CATS, THIS IS THE ONLY ISSUE YOU WILL RECIEVE
Dues = $15.00 per year, per family.

DATED MATERIAL